submits at least Claim 7 is in condition for allowance, an early notification of which is earnestly solicited.

35 U.S.C. 103(a) Rejections

Claims 1, 2 and 4-6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (United States Patent No. 6,421,466) in view of Frey (United States Patent No. 5,925,875). Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Frey and further in view of Correa (European Patent Application No. EP1136974A1). Applicant respectfully traverses these rejections, and requests their reconsideration and removal for at least the following reasons.

1. Lin Fails To Teach or Suggest A Dithering Function That Refines Grey Scale Of Video Pictures Of Video Data Based On Motion Vectors

Lin is directed to a method for compressing a digital-video sequence of images. Lin suggests that dithering methods can be used for reducing the width or number of bits of each pixel. Lin neither teaches nor suggests that the dithering refines the grey scale portrayal of video pictures of video data – as is recited by Claim 1.

The Office action argues Lin inherently "refines" grey scale of a video data as luminance data "is kept" throughout processing, and refers to column 8, lines 12-12 of Lin as evidence thereof. This assertion is without merit. While column 8, lines 12-14 of Lin may disclose that the original, level-2, level-3 and level-4 pictures all use 8-bit pixels that contain just the Y component, the the mere fact that luminance values are not lost by Lin's compression, which is achieved through pixel averaging, does not mean that Lin proposes any dithering function that "refines" the grey scale of video pictures. Rather, it merely proposes pixel averaging to achieve compression. Nothing in this process teaches or suggests "refining" the grey scale portrayal of video pictures, such as by increasing the number of possible video levels.

For purposes of completeness, Applicant notes "refine" may typically be defined as: to become more fine or polished. Applicant has attached a dictionary

definition of the term "refine" hereto, for the Examiner's reference. This is consistent with the subject application and increasing the number of possible video levels.

Should the Examiner persist in the argument that Lin's pixel averaging to achieve compression somehow refines video picture grey scale portrayals, Applicant requests the Examiner please provide a concise explanation of how averaging pixel values to achieve compression makes the grey scale portrayal of a video picture more fine or polished, in conjunction with identifying those portions of the cited reference(s) upon which such an explanation relies.

2. Frey Fails To Remedy the Shortcomings Of Lin.

Frey teaches an apparatus for reducing fixed pattern noise in an image observed by an array of detectors. *See, Abstract.* Frey proposes a plurality of image-responsive detectors for creating image signals, dithering means for scanning the observed image across the detectors, temporal high-pass filtering and image restoration means for generating a reconstructed image based on the filtered signals. Like Lin, Frey neither teaches nor suggests that the dithering refines the grey scale portrayal of video pictures of video data – as is recited by Claim 1. Instead, the Frey dithering merely moves the observed image across the sensor array. *See, e.g., col. 5, ll. 11-18 ("Concurrent with focusing the image onto the focal plane array 14, an image dither mechanism 18 dithers the observed image across the detectors in the focal plane array 14. Dither is the intentional motion of the observed image with respect to the sensing array. The dither mechanism 18 can either scan the observed image relative to the focal plane array, or the dither mechanism can scan the focal plane array relative to the observed image.").*

While the dithering operation of Frey may correct differences in the responses of the individual image detectors forming the array *(see, col. 1, ll. 13-16)*, it does not refine the grey scale portrayal of pictures in a video, *e.g.*, increase the number of possible video levels. Thus, as Frey also fails to teach or suggest a dithering function that refines the grey scale portrayal of video pictures of video data, it is clear that Frey fails to remedy at least this shortcoming of Lin.

For purposes of completeness, Applicant notes that in the embodiment illustrated by Figure 12 and described at column 10, lines 34-45 of Frey, it is proposed to use an adaptive restoration filter including a means for performing scene-to-scene registration to measure the object space motion and to estimate a dither pattern from that motion. However, the dithering of Frey is still the intentional motion of the observed image with respect to the sensing array, and does not refine the grey scale portrayal of video pictures.

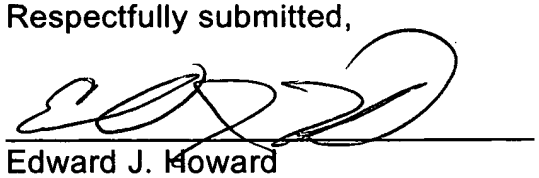
For the foregoing reasons, Applicant respectfully requests reconsideration and removal of the rejection of Claim 1. Applicant also requests reconsideration and removal of the rejections of Claims 2-6 as well, at least by virtue of these claims' ultimate dependency upon a patentably distinct base Claim 1.

CONCLUSION

Applicant believes he has addressed all outstanding grounds raised by the Examiner and respectfully submits the present case is in condition for allowance, early notification of which is earnestly solicited.

Should there be any questions or outstanding matters, the Examiner is cordially invited and requested to contact Applicant's undersigned attorney at his number listed below. Should there be any fees due and owing the Patent Office is authorized to charge such fees to Deposit Account 50-3208.

Respectfully submitted,



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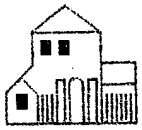

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for easy reference: *Statistical data is referenced in the glossary.* [REFER + -ENCE]
—**Syn.** 5. note, citation. 10. endorsement. 11. consideration, concern.

ref/erence book/, a publication consulted for facts or background information, as an encyclopedia, dictionary, atlas, yearbook, etc.

ref/erence elec/trode, *Physical Chem.* an electrode of known oxidation potential used in determining the electromotive force of a galvanic cell.

ref/erence frame/, *Physics.* See **frame of reference** (def. 2).

ref/erence group/, *Sociol.* a group with which an individual identifies and whose values he accepts as guiding principles.

ref/erence mark/, *Survey.* a permanent mark set at a specific distance in a specific direction from a survey station so as to permit accurate reestablishment of the station.

ref/erence peg/, *Survey.* See **recovery peg.**

ref·er·en·dum (ref/ə ren/dəm), *n., pl.* **-dums, -da** (-də). 1. the principle or practice of referring measures proposed or passed by a legislative body to the vote of the electorate for approval or rejection. Cf. **initiative** (def. 3a). 2. a vote on a measure thus referred. [< L: thing to be carried back (neut. ger. of *referre* to REFER)]

ref·er·ent (ref/ər ənt), *n.* 1. the object or event to which a term or symbol refers. 2. *Logic.* the first term in a proposition to which succeeding terms relate. [< L *referent-* (s. of *referēns*), prp. of *referre.* See REFER, -ENT]

ref·er·en·tial (ref/ə ren/shəl), *adj.* 1. having reference: *referential to something.* 2. containing a reference. 3. used for reference. [REFERENT + -IAL] —**ref/er·en/tial·ly,** *adv.*

re·fer·ral (ri fûr/əl), *n.* 1. an act of referring; the state of being referred. 2. an instance of referring. 3. a person recommended to someone or for something. [REFER + -AL²]

referred/ pain/, *Pathol.* pain felt in an area remote from the site of origin. Also called **synalgia.**

ref·fo (ref/ō), *n., pl.* **-fos.** *Australian Informal.* an immigrant, esp. one who has been in Australia only a short time. [shortening and alter. of REFUGEE]

re·fill (*v.* rē fil/; *n.* rē/fil/), *v.t.* 1. to fill again. —*n.* 2. a material, supply, or the like, to replace something that has been used up: *a refill for a prescription.* [RE- + FILL] —**re·fill/a·ble,** *adj.*

re·fi·nance (rē fi/nans, rē/fī nans/), *v.i., v.t.,* **-nanced, -nanc·ing.** to sell securities in order to redeem (existing bonds or other indebtedness or preferred stock). [RE- + FINANCE]

re·fine (ri fīn/), *v.,* **-fined, -fin·ing.** —*v.t.* 1. to bring to a fine or a pure state; free from impurities: *to refine metal, sugar, or petroleum.* 2. to purify from what is coarse, vulgar, or debasing; make elegant or cultured. 3. to bring to a finer state or form by purifying. 4. to make more fine, subtle, or precise: *to refine one's writing style.* —*v.i.* 5. to become pure. 6. to become more fine, elegant, or polished. 7. to make fine distinctions in thought or language. 8. **refine on** or **upon,** to improve by inserting finer distinctions, superior elements, etc.: *After 30 years, the mature author was able to refine on the work of his youth.* [RE- + FINE¹] —**re·fin/a·ble,** *adj.* —**re·fin/er,** *n.*

re·fined (ri fīnd/), *adj.* 1. having or showing well-bred feeling, taste, etc.: *refined people.* 2. freed or free from coarseness, vulgarity, etc.: *refined taste.* 3. freed from impurities: *refined sugar.* 4. very subtle, precise, or exact: *refined distinctions.* [REFINE + -ED²] —**re·fin·ed·ly** (ri fī/nid lē, -fīnd/-), *adv.* —**re·fin/ed·ness,** *n.*
—**Syn.** 1. cultivated, polished, polite, courteous, civilized, courtly, genteel, elegant. 3. clarified, distilled, purified. —**Ant.** 1. rude, coarse, crude.

re·fine·ment (ri fīn/mənt), *n.* 1. fineness or elegance of feeling, taste, manners, language, etc. 2. an instance of refined feeling, manners, etc. 3. the act or process of refining. 4. quality or state of being refined. 5. a subtle point or distinction. 6. subtle reasoning. 7. an improved, higher, or extreme form of something: *a house that is the ultimate refinement of civilized living; the refinements found in a luxury car.* 8. *Math.* a set whose elements include the elements of a given set. [REFINE + -MENT]

re·fin·er·y (ri fī/nə rē), *n., pl.* **-er·ies.** an establishment for refining something, as metal, sugar, or petroleum. [REFINE + -ERY]

re·fin·ish (rē fin/ish), *v.t.* to give a new surface to (wood, furniture, etc.): *refinishing a table to show the natural wood.* [RE- + FINISH] —**re·fin/ish·er,** *n.*

re·fit (rē fit/), *v.,* **-fit·ted, -fit·ting,** *n.* —*v.t.* 1. to fit, prepare, or equip again. —*v.i.* 2. to renew supplies or equipment. 3. to get refitted. —*n.* 4. an act of refitting. [RE- + FIT¹]

refl., 1. reflection. 2. reflective. 3. reflex. 4. reflexive.

re·flate (ri flāt/), *v.,* **-flat·ed, -flat·ing.** —*v.i.* 1. to increase again the amount of money and credit in circulation. —*v.t.* 2. to increase (money and credit) again. [back formation from REFLATION]

re·fla·tion (ri flā/shən), *n.* the increasing of the quantity of currency of a country in order to restore a price level. [RE- + (IN)FLATION]

RE- + *flectere* to bend] —**re·flect/ed·ly,** *adv.* —**re·flect/ed·ness,** *n.* —**re·flect/i·bil/i·ty,** *n.* —**re·flect/i·ble,** *adj.* —**re·flect/ing·ly,** *adv.*
—**Syn.** 10. ruminate, deliberate, muse, consider, cogitate, contemplate. See **study.** 4. manifest. 6. rebound.

re·flect·ance (ri flek/təns), *n.* *Physics, Optics.* the ratio of the intensity of reflected radiation to that of the radiation incident on a surface. Cf. **albedo.** [REFLECT + -ANCE]

reflect/ed plan/, a plan, as of a room, taken as seen from above but having the outlines of some upper surface, as a vault or compartmented ceiling, projected downward upon it so that a part that would appear at the right when seen from below appears on the plan at the left.

reflect/ing tel/escope. See under **telescope** (def. 1). Also called **reflector.**

re·flec·tion (ri flek/shən), *n.* 1. the act of reflecting or the state of being reflected. 2. an image; representation; counterpart. 3. a fixing of the thoughts on something; careful consideration. 4. a thought occurring in consideration or meditation. 5. an unfavorable remark or observation. 6. the casting of some imputation or reproach. 7. *Physics, Optics.* **a.** the return of light, heat, sound, etc., after striking a surface. **b.** something so reflected, as heat, or esp., light. 8. *Anat.* the bending or folding back of a part upon itself. Also, *esp. Brit.,* **reflexion.** [ME < LL *reflexiōn-* (s. of *reflexiō*) a bending back, equiv. to L *reflex(us)* (see REFLEX) + *-iōn-* -ION] —**re·flec/tion·al,** *adj.* —**re·flec/tion·less,** *adj.*
—**Syn.** 3. meditation, rumination, deliberation, cogitation, study, thinking. 5. imputation, aspersion, reproach, criticism. —**Ant.** 3. heedlessness. 5. praise.

reflec/tion plane/, *Crystall.* a plane through a crystal which divides the crystal into two halves that are mirror images of each other. Also called **symmetry plane.** Cf. **symmetry element.**

re·flec·tive (ri flek/tiv), *adj.* 1. that reflects; reflecting. 2. of or pertaining to reflection. 3. cast by reflection. 4. given to or concerned with meditation: *a reflective man.* [REFLECT + -IVE] —**re·flec/tive·ly,** *adv.* —**re·flec/tive·ness, re·flec·tiv·i·ty** (rē/flek tiv/i tē), *n.*
—**Syn.** 4. contemplative, thoughtful. See **pensive.**

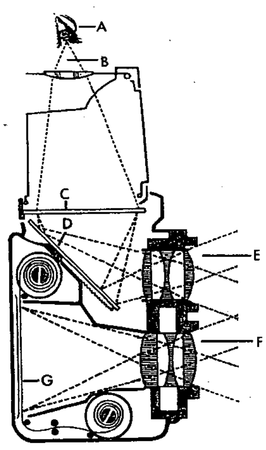
re·flec·tom·e·ter (rē/flek tom/i tər), *n.* *Optics.* a device for measuring reflectance. [REFLECT + -O- + -METER]

re·flec·tor (ri flek/tər), *n.* 1. one who or that which reflects. 2. a body, surface, or device that reflects light, heat, sound, or the like. 3. a reflecting telescope. 4. *Physics.* a substance, as graphite or heavy water, used to prevent the escape of neutrons from the core of a reactor. [REFLECT + -OR²]

re·flec·tor·ize (ri flek/tə rīz/), *v.t.,* **-ized, -iz·ing.** to treat something so that it reflects light: *to reflectorize license plates.* [REFLECTOR + -IZE]

re·flet (rə flā/), *n.* an effect of brilliance or luster due to the reflection of light on a surface, esp. of pottery; iridescence. [< F, earlier *reflès* < It *rifless(o)* reflection; see REFLEX]

re·flex (*adj., n.* rē/fleks; *v.* ri fleks/), *adj.* 1. *Physiol.* noting or pertaining to an involuntary response to a stimulus, the nerve impulse from a receptor being transmitted inward to a nerve center that in turn transmits it outward to an effector. 2. occurring in reaction; responsive. 3. designating a radio apparatus in which the same part performs two functions, as in a reflex klystron, in which one resonator acts as buncher and catcher. 4. cast back; reflected, as light, color, etc. 5. bent or turned back. —*n.* 6. *Physiol.* **a.** Also called **re/flex act/.** movement caused by a reflex response. **b.** Also called **re/flex ac/tion.** the entire physiological process activating such movement. 7. the reflection or image of an object, as exhibited by a mirror or the like. 8. a reproduction, as if in a mirror. 9. a copy; adaptation. 10. reflected light, color, etc. 11. a reflex radio receiving apparatus or set. 12. a reflex camera. —*v.t.* 13. to subject to a reflex process. 14. to bend, turn, or fold back. 15. to arrange in a reflex system. [< L *reflex(us)* bent back, ptp. of *reflectere* to REFLECT] —**re/flex·ly,** *adv.* —**re/flex·ness,** *n.*



Reflex camera (twin-lens)
A, Eye; B, Lens magnifying image on ground glass; C, Ground glass; D, Reflecting mirror; E, Focusing lens; F, Photographic lens; G, Film

re/flex an/gle, *Geom.* an angle greater than 180°.

taking a subject and object with ide[ntical] … as *shave* in *I shave myself.* **b.** (of a pron[oun]) … object to refer to the subject of a verb … *shave myself.* 2. reflex; responsive. 3. … reflective. 4. *Math.* **a.** noting a relatio[n] … element is in relation to itself, as the rel[ation] … or equal to." Cf. **antireflexive.** **b.** (o[f] …) having the property that the dual sp[ace] … space of the given vector space equals … space. —*n.* 5. *Gram.* a reflexive ve[rb] … [< ML *reflexīv(us)* turned back, reflect[ed] … -IVE] —**re·flex/ive·ly,** *adv.* —**re·fle[x]…** **flex·iv·i·ty** (rē/flek siv/i tē), *n.*

ref·lu·ent (ref/lo͞o ənt), *adj.* flowing … the waters of a tide. [< L *refluent-* (s. … of *refluere.* See RE-, FLUENT] —**ref/lu·…**

re·flux (rē/fluks/), *n.* a flowing bac[k] … *reflux(us).* See RE-, FLUX]

re·for·est (rē fôr/ist, -for/-), *v.t.* to r[e]… forest that has been affected by cutt[ing] … like. [RE- + FOREST] —**re/for·est·a/t[ion]…**

re-form (rē fôrm/), *v.t., v.i.* to form … FORM] —**re-form/er,** *n.*

re·form (ri fôrm/), *n.* 1. the improve[ment] … ment of what is wrong, corrupt, uns[atisfactory] … *social reform; spelling reform.* 2. an ins[tance] … the amendment of conduct, belief, et[c.] … **Reform Judaism.** [< F *réforme,* deriv[ed] … —*v.t.* 5. to change to a better state, for … by alteration, substitution, abolition, et[c.] … person) to abandon wrong or evil ways o[f] … 7. to put an end to (abuses, disorders … to abandon evil conduct or error: *The d[…]* *to reform.* [ME *reform(en)* < MF, OF … *reformāre.* See RE-, FORM] —**re…** **re·form/a·ble·ness,** *n.* —**re·form/a·…** **form/a·tive,** *adj.* —**re·form/a·tive·ly,** … **a·tive·ness,** *n.* —**re·form/ing·ly,** *adv.*
—**Syn.** 1. correction, reformation, bette[rment] … tion. 5. better, rectify, correct, amen[d] … orate, repair, restore. —**Ant.** 1. deteri[orate] …

ref·or·ma·tion (ref/ər mā/shən), *n.* … reforming; state of being reformed. … religious movement in the 16th centur[y] … its object the reform of the Roman Cath[olic] … which led to the establishment of … churches. [ME *reformacion* < L *ref…* *reformātiō*), equiv. to *reformāt(us)* (ptp … REFORM) + *-iōn-* -ION] —**ref/or·ma/…**
—**Syn.** 1. improvement, betterment, co…

re·form·a·to·ry (ri fôr/mə tôr/ē, -tor…) … **-ries.** —*adj.* 1. serving or designed t[o] … *atory lectures; reformatory punishment* … called **reform school.** a penal instituti[on] … young offenders, esp. minors. [< L … REFORMATION) + -ORY²]

Reform/ Bill/, *Eng. Hist.* any of th[e] … Parliament (1832, 1867, 1884) providin[g] … in the number of voters in elections … Commons, esp. the bill of 1832 by wh[ich] … boroughs were disfranchised. Also calle[d] …

re·formed (ri fôrmd/), *adj.* 1. amen[ded] … of faults, abuses, etc. 2. improved in … etc. 3. (*cap.*) noting or pertainin[g] … churches, esp. Calvinist as distinguishe[d] … [REFORM + -ED²] —**re·form·ed·ly** (ri …

Reformed/ Church/ in Amer/ic[a] … denomination having a Calvinist theolo[gy] … called the Dutch Reformed Church.

reformed/ spell/ing, a revised … tended to simplify the spelling of En[glish] … to eliminate unpronounced letters, as … *thru* for *through,* *tho* for *though,* *slo* for *sl[ow]* …

Reform/ flask/, an English salt-… flask of the early 19th century forme[d] … one of the figures connected with th[e] … 1832.

re·form·ist (ri fôr/mist), *n.* 1. one … practices reform; reformer. 2. a me[mber] … formed denomination. —*adj.* 3. Als[o] … (re/fər mis/tik). of or belonging to a r[e]… form. [REFORM + -IST] —**re·form/is…**

Reform/ Jew/, a Jew who adhere[s] … ethics and religious worship taken to … of modern Jewry and based on only t[he] … rabbinical laws, liturgical practices, … observances of traditional Judaism th[at] … meaningful in the light of contemp[orary] … Cf. **Conservative Jew, Orthodox Jew**

Reform/ Ju/daism, Judaism as … form Jews.

reform/ school/, reformatory (def. …

Ref. Pres., Reformed Presbyterian.

re·fract (ri frakt/), *v.t.* 1. to subject … to determine the refractive condition o[f] … *refract(us)* broken up, weakened (pt[p] … equiv. to *re-* RE- + *frac-* (perf. s. of *fr[…]* … —**re·fract/a·ble,** *adj.* —**re·fract/ed…** **fract/ed·ness,** *n.*

refract/ing tel/escope. See u[nder] … (def. 1). Also called **refractor.**

re/fer·ti·li/za·ble, *adj.*
re/fer·ti·li·za/tion, *n.*
re·fer/ti·lize/, *v.t.,* **-lized, -liz·ing.**
re·file/, *v.,* **-filed, -fil·ing.**
re·film/, *v.t.*
re·fil/ter, *v.t.*
re·find/, *v.t.,* **-found, -find·ing.**
re·fire/, *v.,* **-fired, -fir·ing.**
re·fix/, *v.t.,* **-fixed, -fix·ing.**
re·float/, *v.*
re/flo·res/cence, *n.*
re/flow/, *v.*
re·flow/er, *n.*
re·fo/cus, *v.,* **-cused, -cus·ing** or (*esp. Brit.*) **-cussed, -cus·sing.**
re·fold/, *v.*
re·fore/cast, *v.t.,* **-cast** or **-cast·ed, -cast·ing.**
re·for/feit, *v.t.*
re·for/fei·ture, *n.*
re·forge/, *v.t.,* **-forged, -forg·ing.**
re·forge/a·ble, *adj.*
re·for/mu·late/, … **-lat·ing.**
re/for·mu·la/tio[n] …
re/for·ti·fi·ca/ti[on] …
re·for/ti·fy/, *v.t.* …
re·for/ward, *v.t.* …